GIS and Area-wide Monitoring

Remote Sensing, Use of Decision Support Systems for Evaluating and Managing Contamination of Waterways

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GIS and Area-wide Monitoring

- Decision support system approaches are now able to integrate GIS (Geographic Information System) techniques, sampling, monitoring, remote sensing, risk assessment, etc.
- Considerable expertise exists in both U.S. and China
- One U.S. system is FIELDS (Fully Integrated Environmental Location Decision Support)

Nine slides illustrating FIELDS, GIS, and remote sensing, as follows:

- Region 5 provided FIELDS workshops in China in June 1998
- Satellite imagery is clean and cheap for map development
- Sampling designs are readily developed, with GIS display
- Contamination levels and maxima can be shown
- Volumes of contamination can be calculated and displayed
- Zones of remaining contamination are shown
- Typical fish contamination data display
- Fish data can related to locational data for risk assessment
- Remote sensing and GIS combine in landscape atlas assessment

Geoinformatics '98 Conference

The Practices, Achievements, and Future of GIS-Based Environmental Decision-Making at USEPA Region 5 in Chicago

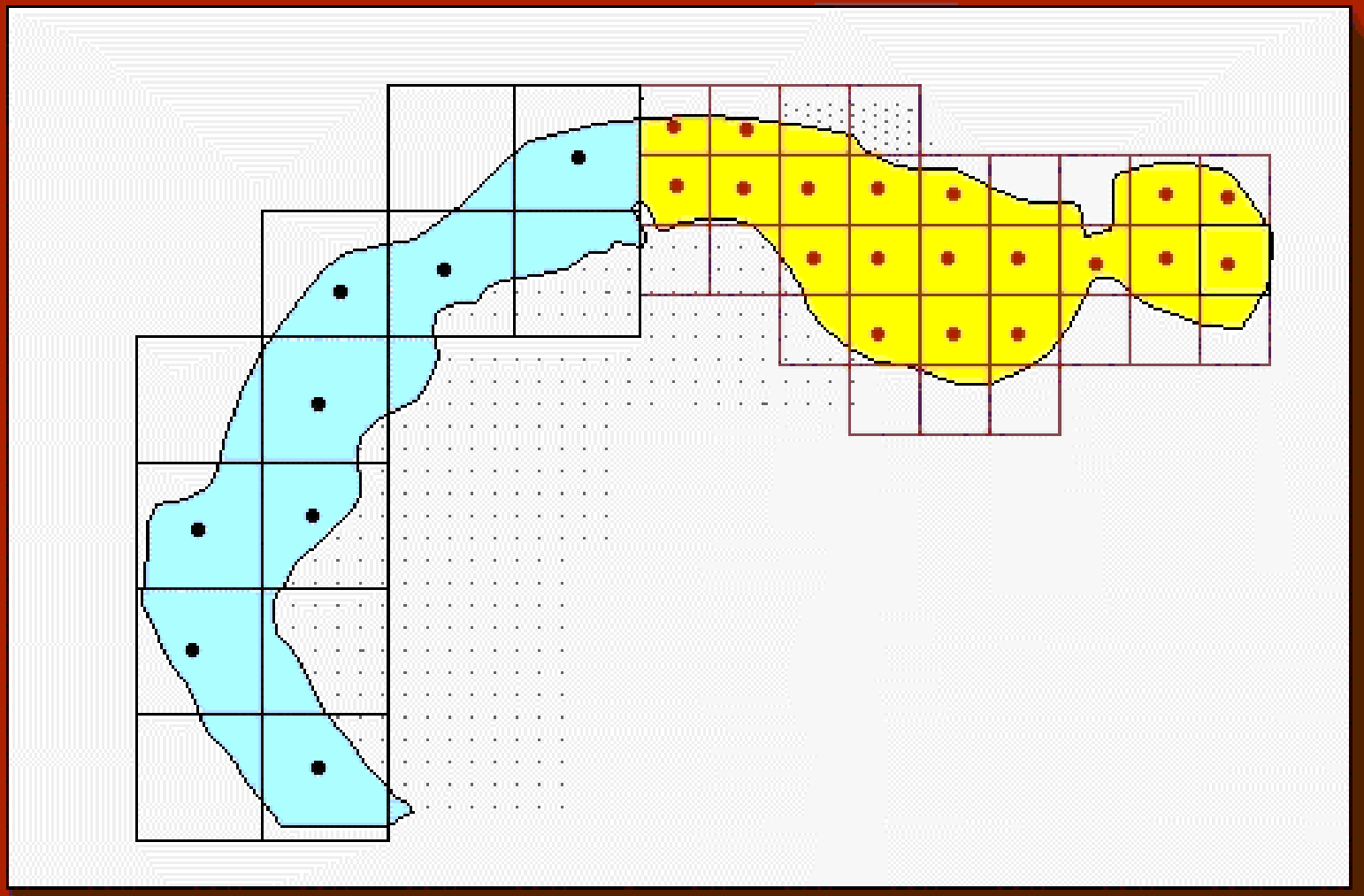
**Matthew Williams, George Graettinger, Howard Zar,
Brian Cooper, Dr. Yichun Xie, Janice Huang**

Satellite Imagery is Clean and Cheap

SPIN 2 Meter Pan Image
The Great Pyramids, Egypt

Landsat 25 Meter RGB
Irrigation wells, Denver Colorado (USA)

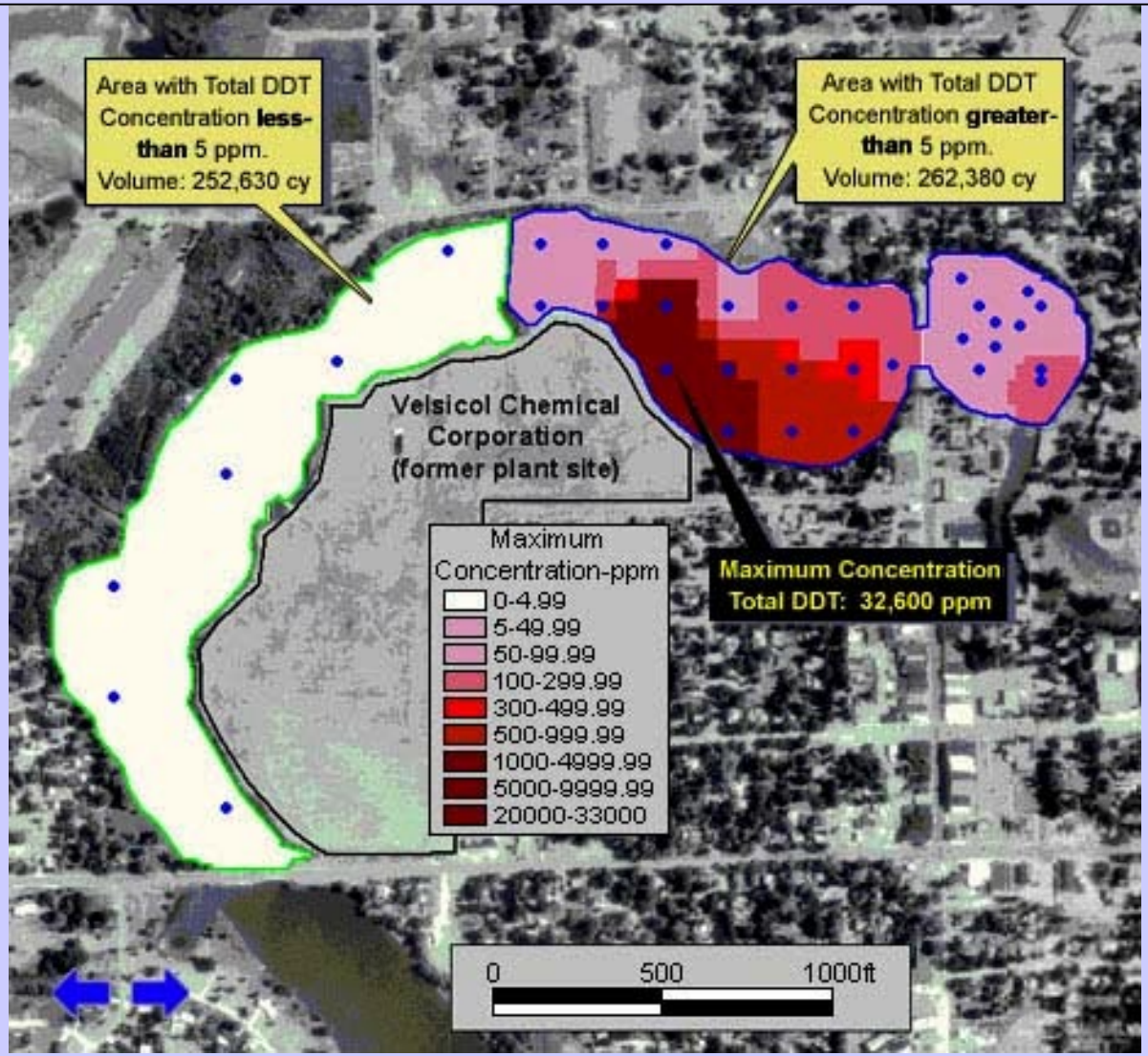
Sampling Designs



Pine River Superfund Site

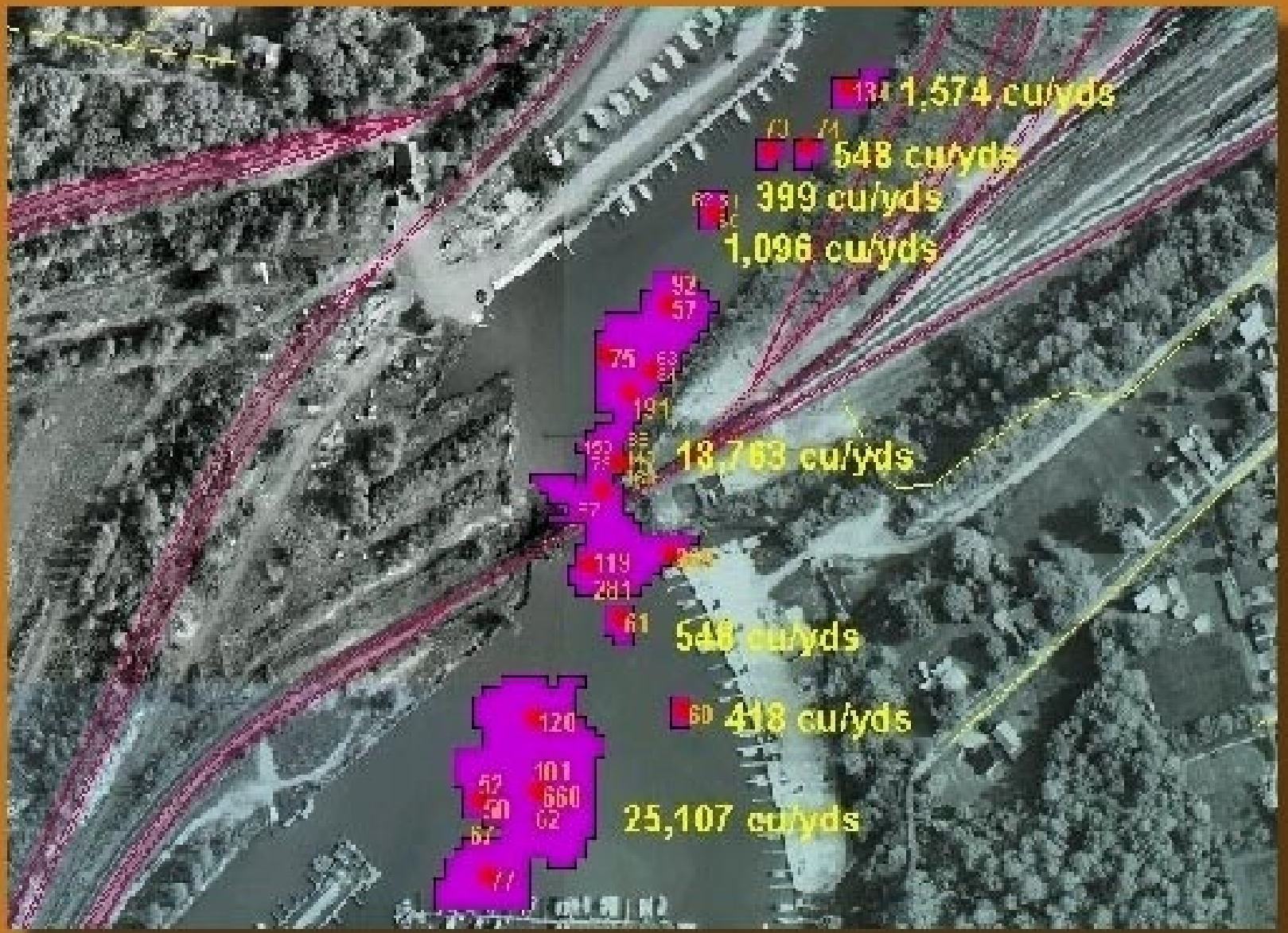
Comparing Volumes

<5ppm and >5ppm

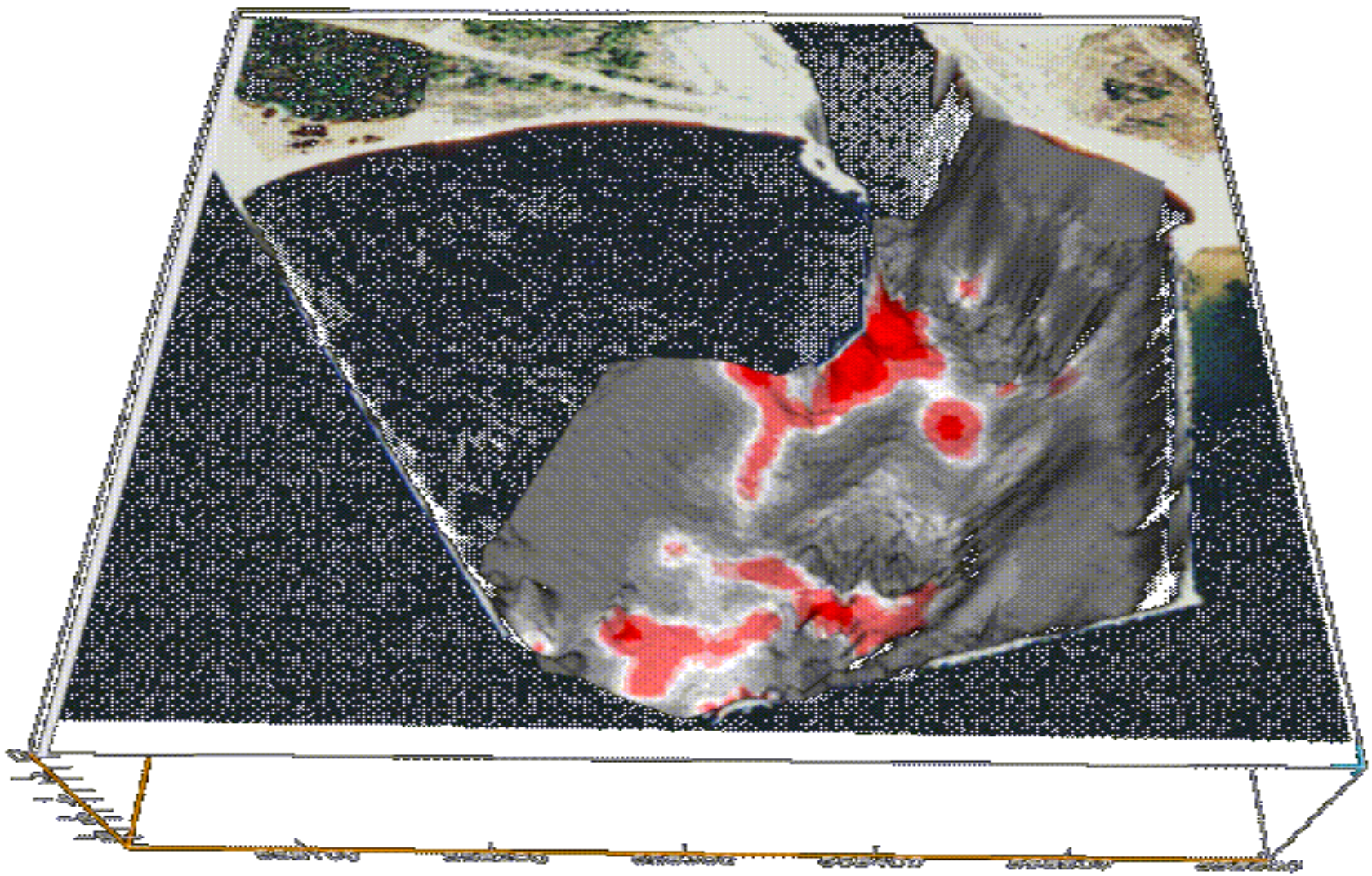


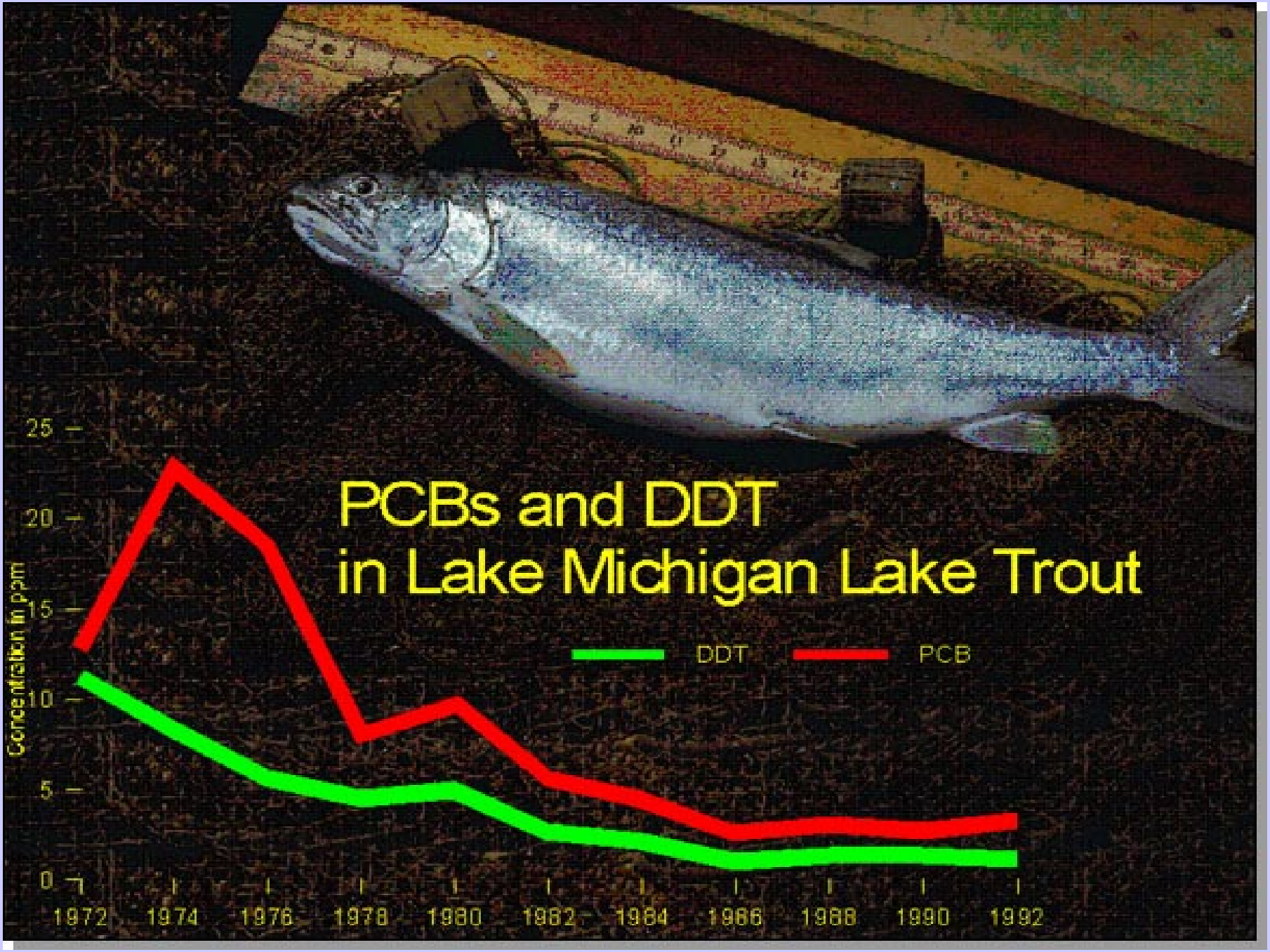
Velsicol Chemical Corporation, Pine River Superfund Site

Volume and Locations of Areas to be Remediated

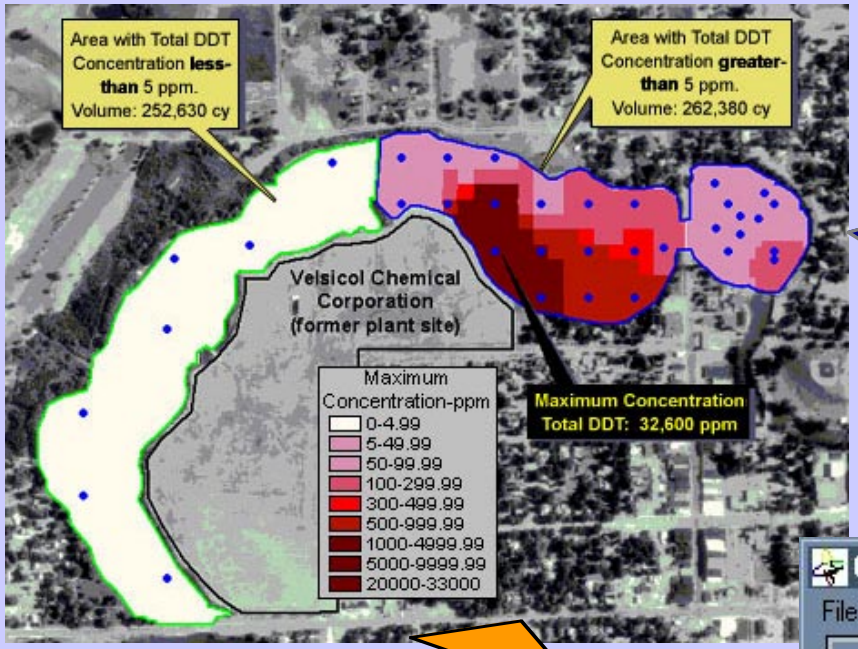


Manistique Harbor
Mean Surface PCB Concentrations Post–Dredging




PCBs and DDT
in Lake Michigan Lake Trout
Concentration in ppm
25
20
15
10
5
0
DDT
PCB
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992

Clean-Up Goals



SEDIMENT

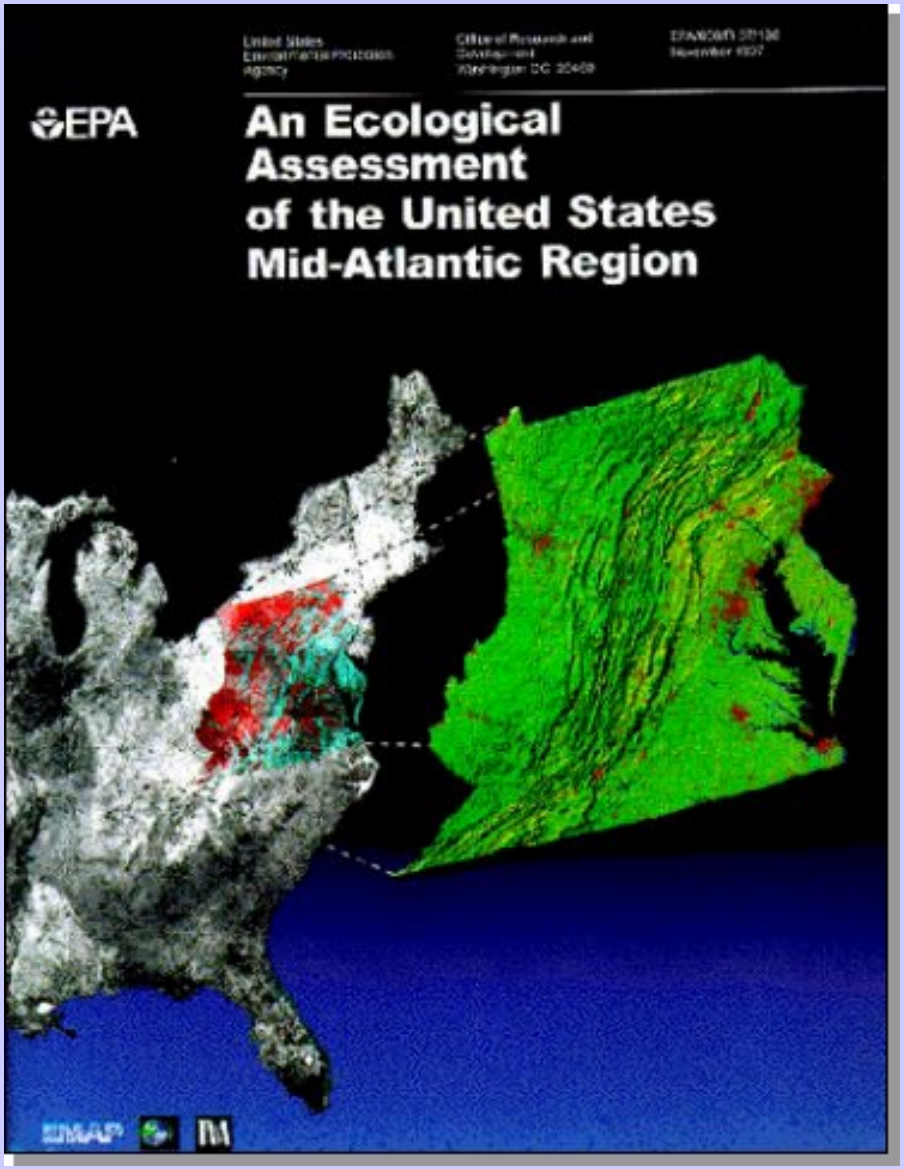
FISH

Query Summary

File

	Concentration	Percent Lipid	Lipid Normalized Concentration
Avg	0.0095	1.5688	0.6075
StDev	0.0025	0.2631	0.1317
Min	0.0067	1.2500	0.3946
Max	0.0150	2.0500	0.7356

Number of Samples: 8
Water Name: Pine River
Species: SMALLMOUTH BASS
Sample Type: F


EPA
An Ecological Assessment of the United States Mid-Atlantic Region

Ideas for Follow-up with FIELDS or other Decision Support Systems

- Bring trainees to U.S. for hands-on experience
- Hold FIELDS/GIS workshops in China
- Pilot application of FIELDS to Cao and Poyang Lakes
- If successful, further expand use of systems within China

Other Ideas for Follow-up - 1

- Co-operate in projects involving application of the landscape atlas approach
- Find remote sensing approaches in China to bring to the U.S.
- Development of geo-spatial data bases
- Coordinated use of remote sensing information
- Acquisition of chemical and physical data
- Visualization of data

Other Ideas for Follow-up - 2

- Evaluation of contaminated sediment and biota
- Evaluation of toxic substances
- Modeling of impacts
- Risk assessments
- Eutrophication
- Decision making

For More Information

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